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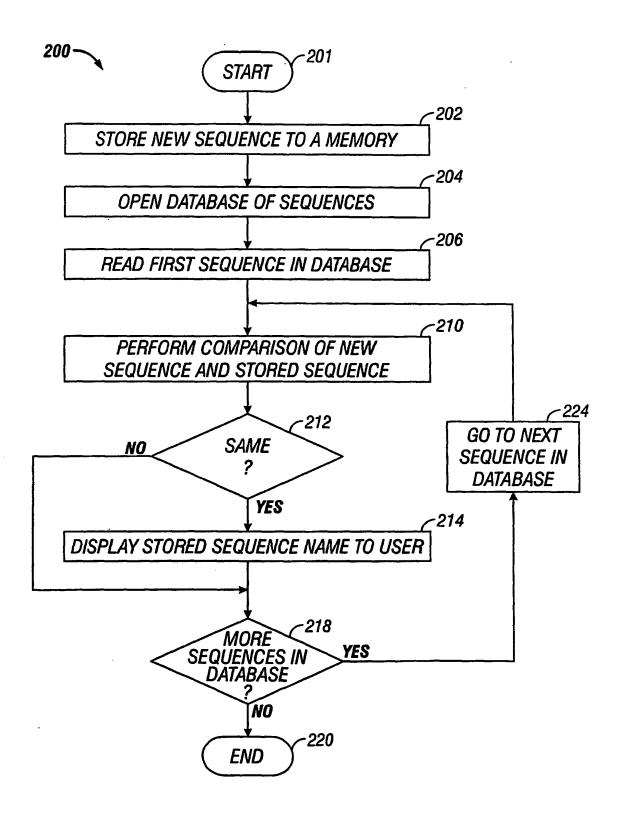
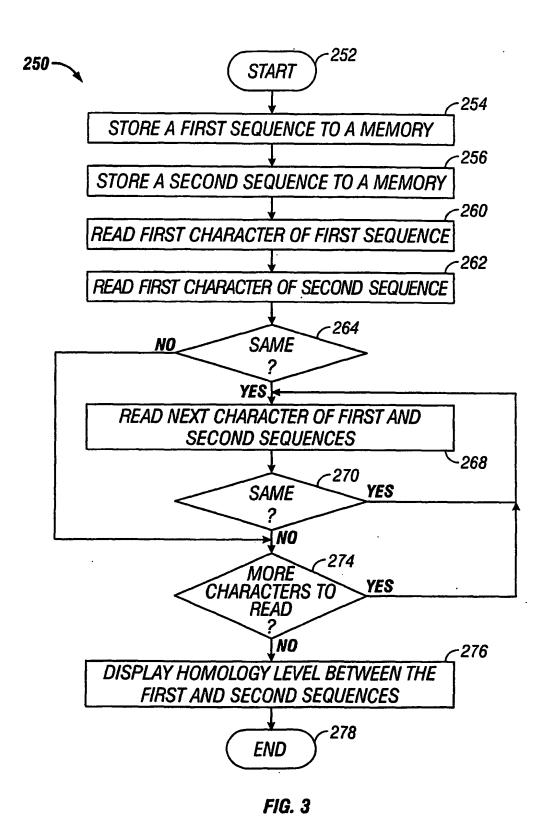


FIG. 2



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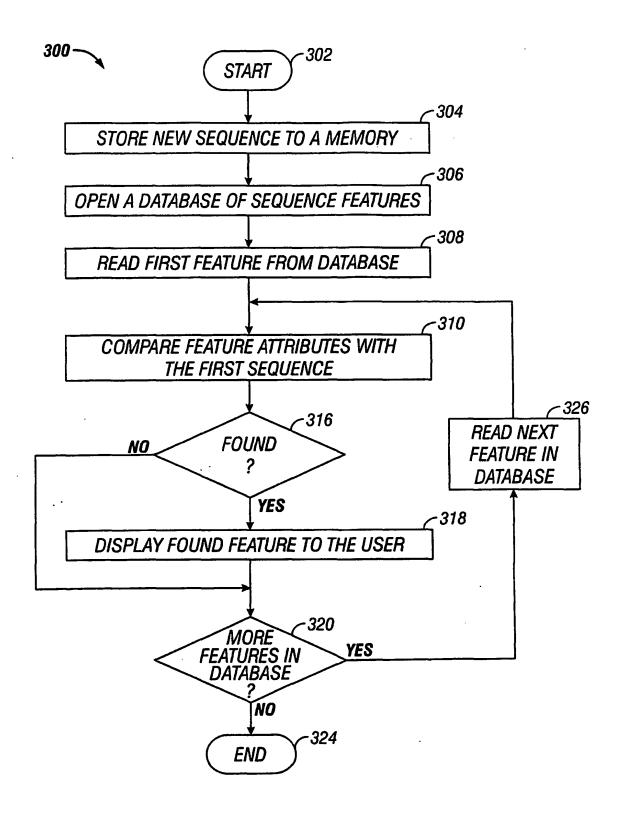


FIG. 4

Figure 5: Thermal Tolerance of Wild-type Xylanase (SEQ ID NOS:189 and 190) vs. 8x Mutant

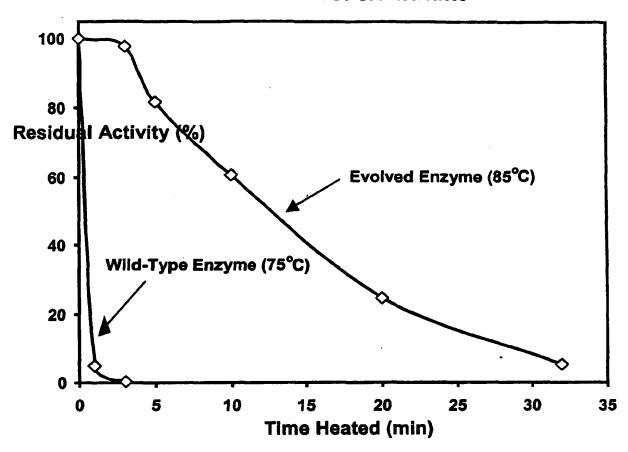


Figure 6

 \mathbf{A}

	_						Amino	o Aci	d Se	auenc	e —				
Mutant	<u>'ı </u>	5	8	11,1	2	17		50	64,65	•			79	189	T_ (°C)
wt	0.	00	∞	200	000	000	xxxx	000	000	20000	0000	0000	200	O	61
D8F	Ο,	00	CQ(∞	000	000	oox	000	000	∞	20000	0000	∞	00	67
Q11H	Ο.	00	ф	∞	000	000	OOO	000	000	20000	20000	0000	200	00	70
N12L	Ο.	00	ထုံး	χф		000	XXXX	000	COC	∞	20000	0000	∞	00	66
G17I	Ο.	00	ф	$\infty \diamond$	фос	XXX	CCCC	000	000	2000	20000	0000	200	00	67
G80	0.	_00	ထင်	ထင်	ဝဝဝ	∞	,oo	900	XXX	∞	20000	0000	200)O	57
P84V	0	_00	∞	သဝ	ဝဝင	∞	XXXX	ဝဝဝ	XOO(2000	20000	0000	200	00	69
365V							000								66
GBBA							000	4							64
S79P							XXXX								84
							Com	iblne	Mut	ations			-		
9X	Ο,	00		ထင်	•cc	xxxi	COO	OCC	x é		00000	0000	oéc	00	96

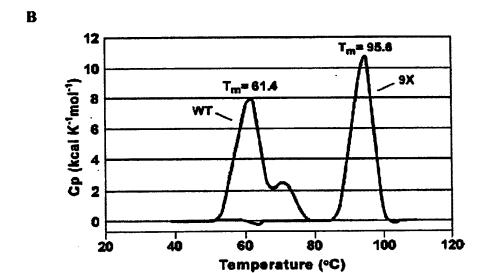


Figure 6

A - Amino Acid Sequence Mutant 1 5 79 189 T_ (°C) 8 11,12 17 60 64,65 68 61 67 70 66 67 67 365V 0...00000000 66 64 S79P **Combine Mutations** 9X

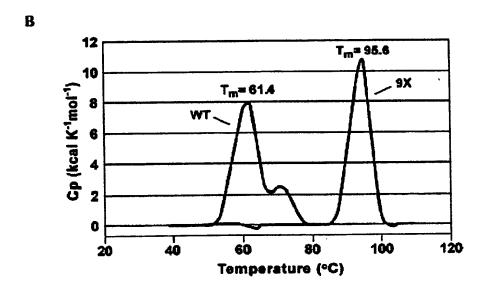
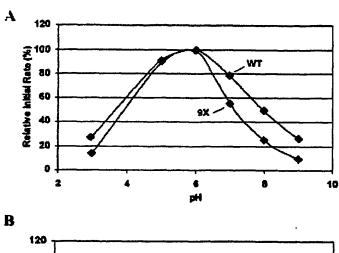
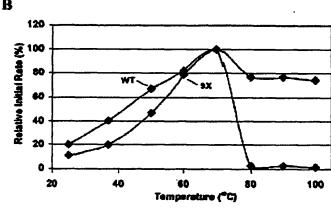


Figure 7





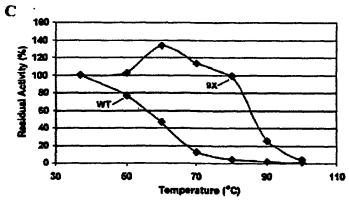


Figure 7

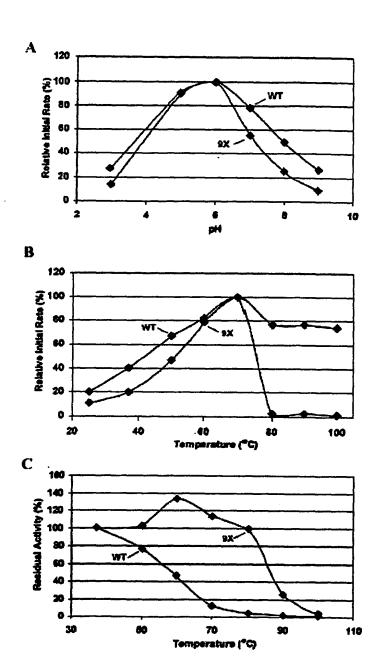


Figure 8

A Amino Acid Sequence Variant T_m(*C) 11,12 17 10 64,86 WT 61 6X-1 89 6X-2 90 7X-1 89 7X-2 91 7X-3 89 7X-4 91 8X-1 90 8X-2 90 8X-3 93 8X-4 94 DEF Q11H | G171 GEOH PERY GENA 371P

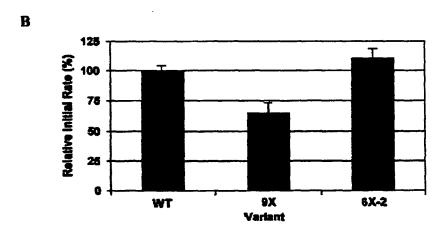


Figure 8

A

	Amino Acid Sequence										
Variant	i	5	•	11,12	17	60	84,86	68	79	189	Tm (°C)
WT	O,	.co	000	00000	000000	000	00000	200000	00000000)O	61
6X-1	Ο.	200 ,	200	00000	000000	000	00800	0000000	00000000	0_0	89
6X-2	Ο.	_CCX	000	0000	000000	OO	0000	000000	20000000	0_0	90
7X-1	Ο.	200	000	00000	000000	000	00060	0000000	0000000	0_0	89
7X-2	Ο.	_CO	00 0	00000	000000	OO	00000	0000000		0_0	91
7X-3	Ο.	_00	000	XX	200000	000	00000	000000	0000000	0_0	89
7X-4	0,		900	0000	000000	000	00000	000000	0000000	0_0	91
8X-1	0,	00	oóc	00000	000000	00	00000	000000	0000000	00	90
8X-2	O.	_OOX)	00 0 00	000600	00	00000	000000	0000000	0_0	90
8X-3	Q,	,00 0	200	00000	000000	00	00000	2000000		0_0	93
8X-4	0.	.00	900	00000	000000	000	00000	0000000	0000000	00	94
9X	0.	,00	000	0000	000000	X)00	00000	000000	0000000	0,0	96
		ı	i D af	OUH N] G171 21.	G40H	P64V 86	GSSA SV) 370)	•	

B

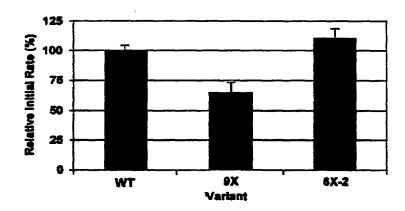


Figure 9

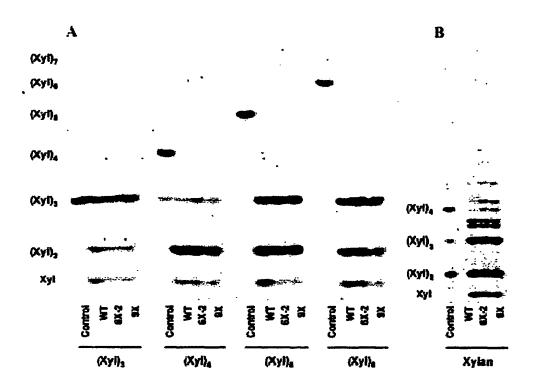


Figure 10

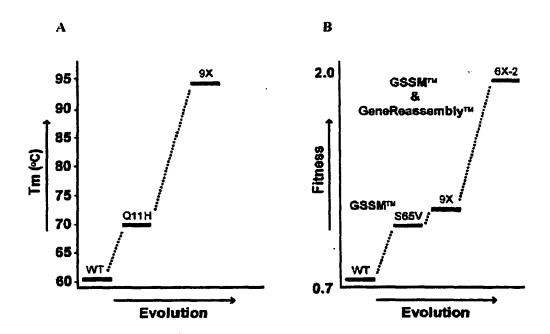


Figure 10

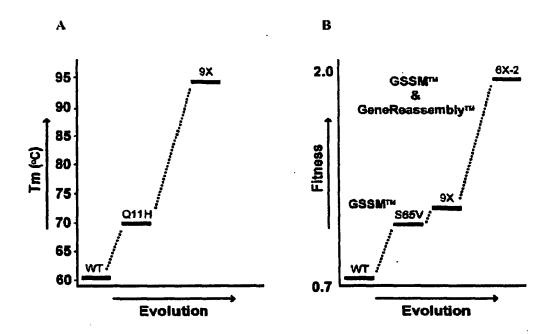
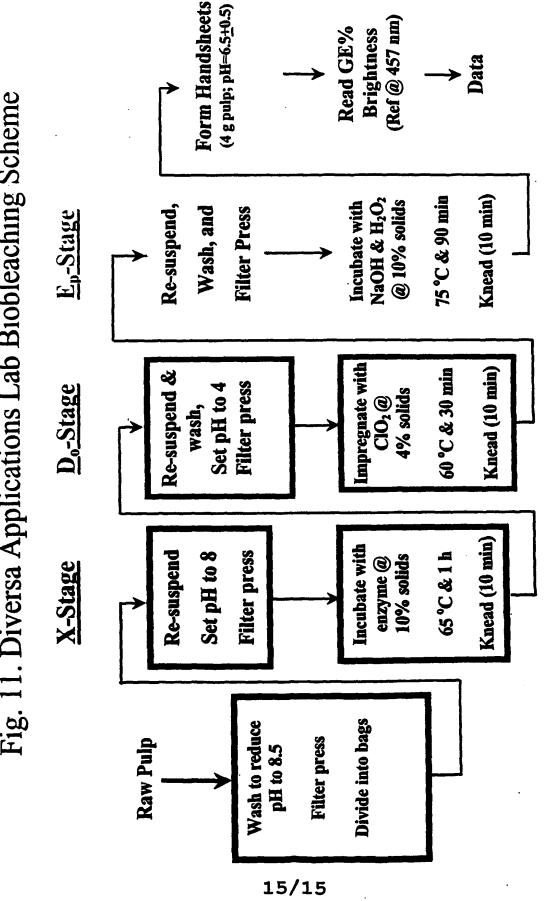


Fig. 11. Diversa Applications Lab Biobleaching Scheme



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